Space Weather Forecast

Issued on Thursday, 12 January 2023 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Moderate flares (R1-R2 radio blackouts) expected. Chance of Strong flares (R3 radio blackouts). A possible glancing blow from a CME later on the 12th January.

Solar Activity: Solar activity has been Moderate over the past 24 hours, with three Moderate flares, two from a complex region in the northeast and one from a complex region in the southwest. There are seven sunspot regions in the total on the visible disc. Five of these have high complexity and carry a high and ongoing flare risk, with only two relatively simple regions. No Earth-directed CMEs (coronal mass ejections) have been observed, but a large eruption to the north on coronagraph imagery is currently undergoing analysis to determine if it has an Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar winds have been generally elevated through the last 24 hours in the influence of a modest fast solar wind. Total magnetic field strength has been generally weak to moderate, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to be Moderate, with a continuing slight chance of Strong flares due to a number of complex active regions on the visible disc.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 09 January could give a glancing blow at Earth later on 12 January, although this is a low probability and low confidence. No other Earth-directed CMEs are in the forecast, although a feature which left the Sun on 11 January will be analysed for a potential arrival. Solar wind speeds slightly elevated due to a weak connection to a fast solar wind, with this likely to decline later on 12 January. No further fast winds are then expected to connect with Earth during the forecast period. Geomagnetic activity is expected to be generally Quiet to Unsettled, although there is a slight chance of Active or G1/Minor Storm intervals later on 12 January and during 13 January due to the possible a glancing impact of the CME.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain at background levels. However, there is a risk of an increase should any significant flares occur, giving a slight chance of exceeding the S1/Minor Storm threshold.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	25	25	25	25

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.